

# TWINDOW

TRADEMARK

THE WINDOW WITH  
*Built-in*  
INSULATION



## What TWINDOW is:

**TWINDOW** INSULATING UNITS are completely prefabricated and consist of two or more pieces of glass enclosing a small hermetically sealed air space. Hollow aluminum tubing separates the pieces of glass. The entrapped air is at atmospheric pressure. It is dehydrated initially by means of a drying agent within the spacer tubing, which has access to the

air space through the holes adjacent to the internal corners. This desiccant provides added insurance against the slightest vapor diffusion.

The entire edge of each Twindow Insulating Unit is encased in a stainless steel channel. This channel protects the seal as well as the edges of the glass during handling and provides a firm and even edge for installing.



## What TWINDOW does:

- Reduces heating costs.
- Decreases load on air-conditioning equipment.
- Permits the use of larger windows.
- Virtually prevents condensation.
- Helps maintain desired temperature and humidity levels.
- Minimizes cold downdrafts at windows.
- Adds to comfort and health the year 'round.
- Installs as simply as a single pane of glass.
- Requires cleaning on only two surfaces.
- Combines ideally with PC Glass Block construction.

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PITTSBURGH PLATE GLASS COMPANY



# TWINDOW

**GLASS COMBINATIONS**—The glass used in the standard Twindow Unit is polished Plate Glass. For special purposes, however, Twindow Units can be readily made up of other types of glass or combinations of glass, of which the following are examples:

1. Solex Heat-absorbing Plate Glass, together with regular Polished Plate Glass, resulting in an appreciable reduction in the transmission of solar heat.
2. Water White Plate Glass, permitting true color definition with maximum clarity of vision.
3. Hi-Test Duplate, Duolite and Aerolite laminated Safety Glasses, affording added protection and safety from impact.
4. Herculite Tempered Plate Glass, providing strength (about four times that of Plate Glass) and impact resistance.
5. Polished Wire Glasses, providing an efficient fire retardant.
6. Heavy Polished Plate Glasses, ranging from  $\frac{3}{8}$ " to  $1\frac{1}{4}$ " giving strength with good vision.
7. Figured Ornamental Glasses with numerous patterns, permitting effective illumination — translucency without transparency—and diffusion of light.
8. Sand-blasted Finish of one surface or to a line, providing semi-opacity and light diffusion.
9. Blue and Flesh Tinted Plate Glasses, offering decorative and color possibilities.
10. Pennvernon Window Glass and Pennvernon Heavy Sheet Glass, where openings to be glazed are small and where maximum clarity of vision is not of paramount importance.

**QUALITIES**—"Glazing" Quality Polished Plate Glass, "A" Quality Pennvernon Window Glass and "Standard" Quality Rolled Glass will be used in all Twindow Units.

**AIR SPACES**—Air spaces of  $\frac{1}{4}$ " or  $\frac{1}{2}$ " (approx.) will be furnished at the same price. Rabbit width and glazing limitations should usually determine the air space dimension.

**EDGE CONSTRUCTION**—Twindow Units are protected with a light-gauge stainless steel channel with the channel legs extending about  $\frac{1}{8}$ " inwards on the surface of the glass from the base around its periphery. The smooth protected edges make for ease of handling and installation.

**PATTERNS**—Twindow Units can be supplied in most combinations of straight edges. Write for special quotations and information about ability to supply Twindow with curved edges.

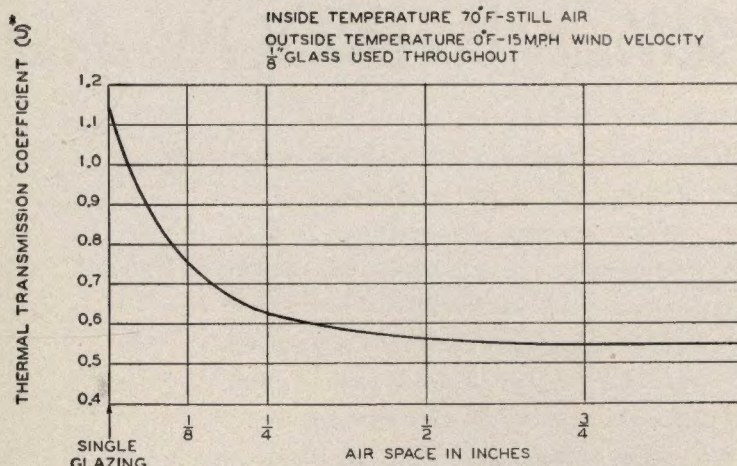
**BENT SHAPES**—Simple cylindrical bends can be fabricated within certain limitations. Prices and details will be supplied on application.

**STANDARD SIZES**—Twindow standard sizes for picture windows are available. For this information contact your dealer or the nearest Pittsburgh Plate Glass Company warehouse.

**REFRIGERATED DISPLAY CASES**—Combining insulation with clear vision, Twindow Units containing two or more pieces of glass are ideal for refrigerated flower, candy, meat, produce and frozen food cases. As the degree of refrigeration determines the number of pieces of glass required in a unit, it is suggested that inquiries be sent to us until specialized literature is available, stating the application and temperature to be maintained within the case.

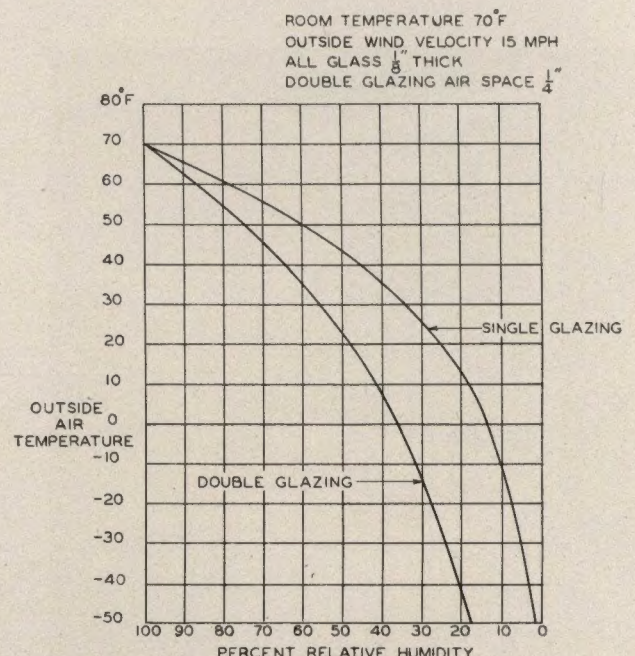
**TEST CHAMBER MULTIPLE GLAZING**—Clear vision inspection panels in Experimental Test Chambers operating at extremely low temperatures, high and low pressures, and other unusual conditions, successfully utilize the high insulating value of multiple-glazed Twindow Units. Each application of this kind should be referred to us, accompanied by the pertinent operating data, for a specific recommendation.

TWINDOW OVERALL THERMAL CONDUCTIVITY  
VARIATION WITH AIR SPACE THICKNESS



\* BTU/SQFT/HR/DEGREE F TEMPERATURE DIFFERENCE

OUTSIDE TEMPERATURE REQUIRED TO PRODUCE  
CONDENSATION ON ROOM SIDE GLASS SURFACE





# INSTALLATION

**SASH**—Most sash now available was designed for a single thickness of glass. Several manufacturers of metal and wood sash have introduced new designs to accommodate the extra thickness and weight of Twindow, while others are contemplating similar action.

Since correct Twindow sizes and the provision of adequate glazing rabbet dimensions are the responsibility of the glazing contractor, he should recheck these points with the architect or owner.

In the following discussion of sash, the glazing rabbet dimensions referred to are defined as:

- (a) Height or depth—the vertical or short dimension (in a normal sill section).
- (b) Width—the horizontal or long dimension (in a normal sill section).

The height of the Twindow Unit stainless steel channel border is about  $\frac{3}{8}$ ". Glazing clearances of  $\frac{1}{8}$ ",  $\frac{3}{16}$ " or  $\frac{1}{4}$ ", depending on Twindow size, consequently require a minimum theoretical rabbet height of  $\frac{1}{2}$ " or  $\frac{5}{8}$ " to hide completely the metal edge from the sight opening.

**STEEL SASH**—Existing steel sash varies in rabbet width from  $\frac{3}{4}$ "— $1\frac{3}{8}$ ", depending on the type of window and particular style of the manufacturer. Twindow Units constructed with  $\frac{1}{8}$ " glass and a  $\frac{1}{4}$ " air space should not

be glazed in a  $\frac{3}{4}$ " rabbet sash. However, they will glaze as a tight fit in a  $\frac{1}{2}$ " rabbet sash, and will glaze with ease in  $1\frac{1}{4}$ " and  $1\frac{3}{8}$ " rabbet sash. Twindow Units constructed with  $\frac{1}{4}$ " glass and a  $\frac{1}{4}$ " air space may be satisfactorily glazed in  $1\frac{1}{4}$ " and  $1\frac{3}{8}$ " rabbet sash. However, we recommend the use of steel sash with a  $1\frac{3}{8}$ " rabbet whenever possible. All steel sash, regardless of variation in rabbet width, have an actual rabbet height or depth of  $\frac{3}{8}$ " maximum.

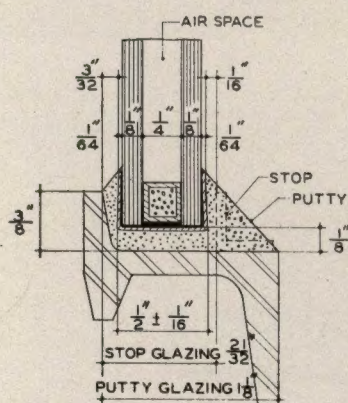
**MOVABLE WOOD SASH**—While at present regular  $1\frac{3}{8}$ " thick wood sash is considered too thin to accept Twindow Units,  $1\frac{3}{4}$ " sash specially rabbeted to provide a wide, deep rabbet is very satisfactory. A minimum number of cross muntins are recommended as Twindow Unit glazing requires heavier muntins.

**STATIONARY WINDOWS SET IN WOOD**—Difficulty should not be encountered in the glazing of large fixed Twindow Units, such as picture windows, as most sash of this size is special and can be milled with a wide, deep rabbet to provide adequate glazing space.

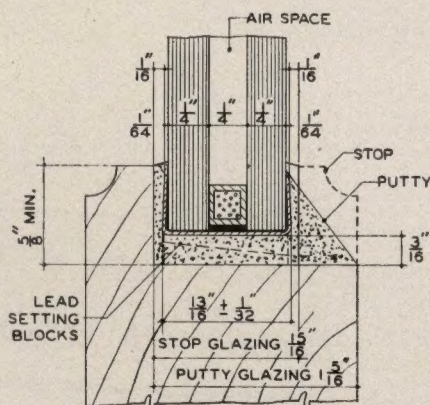
**TWINDOW STORE FRONT UNITS**—Installation in Store Front Metal will require consideration in each individual application. Recommendations will be made by the Store Front Department for setting members to meet the existing conditions.

## GLAZING PROCEDURE

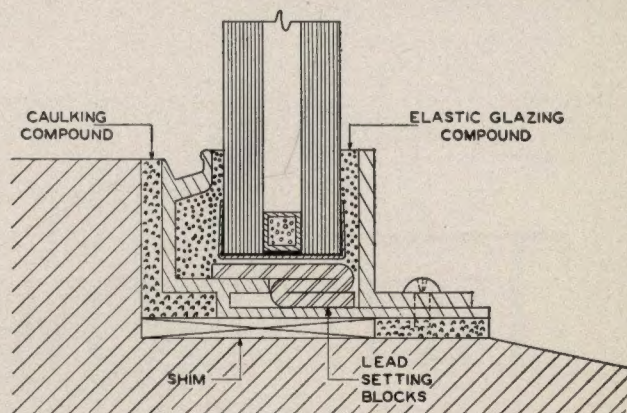
1. All openings must be square and free from glazing obstructions.
2. If Twindow Units are to be installed in standard steel sash, special Twindow Unit glazing clips are recommended, although the regular steel sash clips may be used if given an additional bend to allow for the extra Twindow thickness.
3. Twindow Units may be glazed with any proven type of steel sash or wood sash, linseed oil base putty or elastic glazing compound.
4. Shims or setting blocks are always helpful in equally spacing a unit in an opening. Twindow Units 36" to 60" in width, and/or weighing 50 to 80 lbs. should be set on two lead or leather setting blocks 2" long and as wide as the unit is thick. These blocks should be placed  $\frac{1}{4}$  of the width in from each end of the unit. Additional setting blocks (complementary wedge type) should be spaced evenly under longer or heavier units to assure proper distribution of load.
5. Use approximately  $\frac{1}{8}$ " back putty on all units.
6. Bed putty the sash.
7. Each Twindow Unit has a label, "Top-Inside." Place the unit in position accordingly.
8. All small openings should be measured to allow  $\frac{1}{8}$ " glazing clearance on all sides, while larger openings should allow a clearance of  $\frac{3}{16}$ " to  $\frac{1}{4}$ ". Distribute this clearance proportionately. Never force a unit into place.
9. Point up all voids around the unit before face puttying.
10. In setting Twindow Units in wood sash, the glazing points should be set by hand.
11. Rabbet heights less than  $\frac{1}{2}$ "— $\frac{5}{8}$ " may reveal the stainless steel channel in the sight opening. If this is considered objectionable, the back putty may be struck off at an angle to hide the channel.



TWINDOW IN STEEL SASH



TWINDOW IN WOOD SASH



TWINDOW STORE FRONT UNIT



# TWINDOW

**ORDERING INSTRUCTIONS**—All openings must be square and free from glazing obstructions. Take-off sizes for small openings should allow  $\frac{1}{8}$ " glazing clearance on all sides, while for larger openings a  $\frac{3}{16}$ "— $\frac{1}{4}$ " allowance should be made.

In placing an order, state specifically the following:

1. Which dimension is width; and which the height.
2. Type and thickness of glass from which the Twindow is to be fabricated.
3. Thickness of the air space desired.
4. Any unusual operating conditions which might be encountered.

**HOW TO SPECIFY**—Wherever shown on drawings and details, multiple-glazed insulated units shall be Twindows (hermetically sealed double or multiple glass units) as manufactured by the Pittsburgh

Plate Glass Company. Each Twindow shall be identified by the manufacturer's label, which is to remain on the unit for the Architect's inspection.

**GUARANTEE**—During a period of five (5) years after date of manufacture, Twindow Insulating Units are guaranteed not to develop, under normal conditions, material obstruction of vision as a result of dust or film formation on the inner glass surfaces. Any Units failing to comply with the terms of this guarantee will be replaced F.O.B. nearest shipping point to place of installation. This represents our maximum liability. This guarantee is effective only if installation is made in accordance with our specific instructions and does not apply to units damaged by poor handling or improper installation.

For additional information, address Pittsburgh Plate Glass Company, Grant Building, Pittsburgh 19, Pa.

## DIMENSIONS

## WEIGHTS

	Glass† Thickness	Air Space†	Max. Size*	Dimensional Tolerances	Unit Thickness		Approximate Average Net Weights Per Sq. Foot
					$\frac{1}{4}$ " Air Space	$\frac{1}{2}$ " Air Space	
<b>DOUBLE GLAZED</b>	$\frac{1}{8}$ "	$\frac{1}{4}$ " or $\frac{1}{2}$ "	12 Sq. Ft.	+or— $\frac{1}{16}$ "	$\frac{1}{2}$ " $\pm \frac{1}{16}$ "	$\frac{13}{16}$ " $\pm \frac{1}{32}$ "	3½ pounds
	$\frac{1}{4}$ "	$\frac{1}{4}$ " or $\frac{1}{2}$ "	70 Sq. Ft.	Under 36" + $\frac{1}{8}$ "— $\frac{1}{16}$ " 36" and Over + $\frac{3}{16}$ "— $\frac{1}{16}$ "	$\frac{13}{16}$ " $\pm \frac{1}{32}$ "	$\frac{1}{16}$ " $\pm \frac{1}{32}$ "	7 pounds
<b>TRIPLE GLAZED</b>	$\frac{1}{8}$ "	$\frac{1}{4}$ " or $\frac{1}{2}$ "	12 Sq. Ft.	+or— $\frac{1}{16}$ "	$\frac{15}{16}$ " $\pm \frac{1}{32}$ "	$\frac{1}{16}$ " $\pm \frac{1}{32}$ "	5¼ pounds
	$\frac{1}{4}$ "	$\frac{1}{4}$ " or $\frac{1}{2}$ "	35 Sq. Ft.	Under 36" + $\frac{1}{8}$ "— $\frac{1}{16}$ " 36" and Over + $\frac{3}{16}$ "— $\frac{1}{16}$ "	$\frac{15}{16}$ " $\pm \frac{1}{32}$ "	$\frac{1}{16}$ " $\pm \frac{1}{32}$ "	10½ pounds
<b>QUADRUPLE GLAZED</b>	$\frac{1}{4}$ "	$\frac{1}{4}$ "	35 Sq. Ft.	Under 36" + $\frac{1}{8}$ "— $\frac{1}{16}$ " 36" and Over + $\frac{3}{16}$ "— $\frac{1}{16}$ "	$1\frac{13}{16}$ " $\pm \frac{1}{32}$ "		15 pounds

†Glass thickness and air space are subject to practical manufacturing tolerances.

\*Special quotations for sizes not listed in the price schedule will be made upon application.

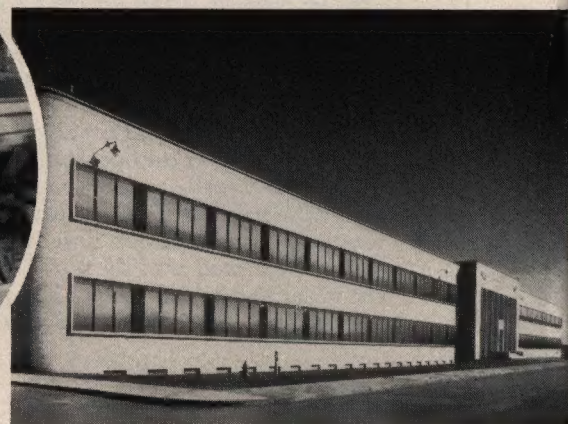
## TYPICAL APPLICATIONS



**STORE FRONTS**—Twindow makes an ideal display window for all kinds of stores because its built-in insulation reduces heating costs and keeps the glass free of condensation.



**REFRIGERATED CASES**—Customers always have a clear view of refrigerated products displayed in cases which are glazed with Twindow. No dirt or moisture can enter Twindow's sealed-in air spaces.



**INDUSTRIAL BUILDINGS**—When Twindow is used for factory windows, manufacturing processes requiring uniform temperatures and humidities can be carried on without condensation on windows or sacrifice of daylight vision.

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PITTSBURGH PLATE GLASS COMPANY



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